

# **EXHIBIT 13**

**[UNREDACTED in the PUBLIC RECORD]**

1 UNITED STATES DISTRICT COURT NORTHERN DISTRICT OF  
2 CALIFORNIA SAN JOSE DIVISION  
CASE NO. 5:16-cv-00523-RMW

3 30(b)(6) DEPOSITION OF SEAGATE July 26, 2017  
4 TECHNOLOGY, LLC BY GLEN ALMGREN

5 IN RE SEAGATE TECHNOLOGY, LLC LITIGATION

6 APPEARANCES:

7 AXLER GOLDICH, LLC

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1 accelerated life testing in connection with  
2 calculating AFRs?

3 A Yes. That's had reason that our test is  
4 run at elevated temperature.

5 Q So what accelerated life testing is  
6 performed in particular?

7 A In addition to the six-week demonstration  
8 reliability testing, that test is extended out past  
9 six weeks. The six-week number is what we use to  
10 calculate our AFRs, but we keep the testing running  
11 out past that and out past what customers will  
12 ultimately test to to do exactly that, to -- it's a  
13 long-term accelerated test that we use to ensure that  
14 we don't have failure modes that exist even out past  
15 the six-week test.

16 Q So -- so initially, there's a six-week  
17 test period; is that right?

18 A Correct.

19 Q At a temperature, did you say it was 60  
20 degrees Celsius?

21 A Yes.

22 Q And based on that test, you come up with  
23 the AFR; is that right?

24 A That is right.

1 Q And then you extend the test past the six  
2 weeks for purposes of accelerated life; is that  
3 correct?

4 A Yeah.

5 Q How long do you -- do you run those tests,  
6 those extended life tests?

7 A We run it at a minimum of nine weeks.  
8 There can be -- there can be testing extended past  
9 that, but it's typically nine weeks.

10 Q What sort of circumstances would there be  
11 for a drive to need to do more than a nine-week  
12 extension test?

13 MS. MCLEAN: Objection. Beyond the scope,  
14 calls for speculation.

15 A Relative to Grenada?

16 Q (By Mr. Goldich) First, in general.

17 MS. MCLEAN: Same objections.

18 A In general, we do -- we do longer testing  
19 for our Enterprise test drives because of the  
20 environment they're in and the longer warranty period  
21 of Enterprise drives versus Desktop drives.

22 Q (By Mr. Goldich) So typically for a  
23 Desktop drive, you would do a nine-week accelerated  
24 life beyond the six-week test, and you wouldn't

1 extend beyond that nine weeks, correct?

2 A We wouldn't extend beyond -- beyond the  
3 nine weeks as a whole, typically would not.

4 Q Did you extend beyond nine weeks with  
5 Grenada?

6 A I don't recall.

7 Q So what is six weeks in testing equivalent  
8 to in realtime?

9 MS. MCLEAN: You're talking about the AFR  
10 calculation?

11 Q (By Mr. Goldich) For the AFR calculation.

12 A Well, we -- we use the AFR -- the data for  
13 those calculations to assume at a minimum of the  
14 one-year field performance. Testing itself from a  
15 right read through put standpoint actually  
16 demonstrates three to five years' worth of an end  
17 user's actual usage of the drive.

18 Q So the six weeks is intended to simulate a  
19 minimum of one year, and potentially three to five?

20 A Correct.

21 Q Do you perform thermal surveys in  
22 connection with your AFR testing?

23 A What do you mean, thermal surveys?

24 Q To test the temperature of certain parts

1 Q And were the tests ongoing at the time of  
2 this writing?

3 A Yes.

4 Q Okay. So it's 433 hours out of how many?

5 A We'll run for six weeks or 1,008 hours.

6 Q So it was almost halfway finished?

7 A Correct.

8 Q All right. What about this next sentence  
9 here?

10 A "The key learning from this regression  
11 will be the reduction of degrade readers and new  
12 media defects."

13 Q Okay. So what -- what does this mean?

14 A What this means, there was -- excuse  
15 me -- what this means, there was a need to  
16 demonstrate an improvement for degrade readers, and  
17 then also for new media defects. So those would have  
18 been two failure modes that would have been  
19 encountered in testing prior to MAT 2.0.

20 Q The next sentence says, "Currently demo  
21 101k MTBF and potential of 167k," right?

22 A Correct.

23 Q And what does that mean?

24 A What that means is where the product is

1 currently demonstrating 101k or 101,000 hours. So  
2 101,000 is basically the number -- the MTBF, the  
3 units are in time. So this is saying it's 101,000  
4 MTBF. That's what's being demonstrated, and then  
5 there's a projection or a potential of 167,000 hours.

6 Q Okay. So -- so the drives were currently  
7 demonstrating 101,000 mean time between failures,  
8 correct?

9 A Correct.

10 Q And a potential of 167,000 mean time  
11 between failure, correct?

12 A Correct.

13 Q And the potential is a -- is an estimation  
14 based on what exactly?

15 A It's an estimation based on fixes that are  
16 upcoming, but may not be validated yet.

17 Q Okay. So you identify problems, for  
18 instance in this case, degrade readers and new media  
19 defects, right?

20 A Correct.

21 Q You propose a corrective action or fix,  
22 correct?

23 A Correct.

24 Q And then you calculate the change and the

1 mean time between failure after the corrective action  
2 is implemented?

3 A Yes. When the corrective action is  
4 implemented and demonstrated, that's that 101k MTBF  
5 number.

6 Q Oh, I see. So the corrective action was  
7 actually implemented to get the 101,000 mean time  
8 before failure?

9 A Correct. Right.

10 Q And the potential is if all the corrective  
11 actions work?

12 A No. No. The -- the corrective actions  
13 work to get to that 101k number. The potential is --  
14 the way to think of that is if there was something  
15 that is coming in two weeks, for example, but it's  
16 not -- it's not there, but it's coming, and we know  
17 that it's going to provide an improvement. It's  
18 really just that. It's really just a projection of  
19 maybe the next -- the next step function up --

20 Q Okay.

21 A -- in reliability.

22 Q I think I understand.

23 MS. MCLEAN: Let's try not to step on each  
24 other's questions and answers.



1 A Yes.

2 Q Okay. Now, under this MTBF chart, we have  
3 the word demo, which means demonstrated, right?

4 A Yes.

5 Q And then it says, "Validated end  
6 potential," and earlier we were discussing validated  
7 end potential in terms of corrective action, right?

8 A Yes.

9 Q Okay. So is it correct that the  
10 demonstrated mean time before failure on April 27,  
11 2011 was 101,000, right?

12 A Correct.

13 Q And that was after certain corrective  
14 actions were taken?

15 A Correct.

16 Q And the potential, as we saw in the  
17 Executive Summary, was calculated to be 167,000?

18 A Correct.

19 Q Under there, we have the word goal, and  
20 again, we have some columns that relate to phases,  
21 right?

22 A Yes.

23 Q Okay. So we have the GEN2 phase, and that  
24 states 50k, right?

1 percent of your population fall out.

2 Q Why 63.2 percent?

3 A That's just the characteristic of the  
4 math. It's the distribution, you know. It's nothing  
5 that is related to our testing or anything within  
6 Seagate. It's the characteristic of the Weibull  
7 distribution itself.

8 Q Do you know why Seagate uses the Weibull  
9 distribution as opposed to an exponential  
10 distribution or some other reliability model? I  
11 believe there are four of them, Weibull being one.

12 A It's ultimately been the distribution that  
13 has fit the data the best.

14 Q Any reason why it fits best?

15 A What it does, with typical hard drives,  
16 you have -- if you've heard of the bathtub curve,  
17 it's not just with hard drives, it's with anything  
18 reliability-focused. There are -- there can be  
19 distinct phases of, you know, infant mortality versus  
20 kind of a reduced failure rate versus a wear-out  
21 mechanism, and the Weibull distribution is able to  
22 model those very well.

23 Q Does Seagate test all of its drives with  
24 the Weibull beta that's .608098?

1           A       No. That number is based on the data of  
2 this test bed that we are looking at right here.

3           Q       How do you come to that figure for the  
4 Weibull beta?

5           A       Well, you need a few pieces of data. You  
6 need to know the number of units in the test, which  
7 you have at 1651; you need to know the test time for  
8 the population; and then you need to know the time of  
9 failure for any individual serial number that is in  
10 this.

11          Q       What's a gamma distribution?

12          A       What's a gamma distribution?

13          Q       Yeah.

14                 MS. MCLEAN: And where are you referring  
15 to?

16          Q       (By Mr. Goldich) I'm just asking what a  
17 gamma distribution is, if you know, related to the  
18 reliability testing.

19                 MS. MCLEAN: I'm going to object to lacks  
20 foundation.

21          A       I don't know. I don't know.

22          Q       (By Mr. Goldich) What about chi squared?

23                 MS. MCLEAN: Objection. Lacks foundation.

24          A       What about chi squared?

1 Q So you're referring to the additional  
2 testing beyond the six weeks?

3 A Yes, correct.

4 Q Has the Weibull ever been set to 1 or  
5 greater than 1 for -- for AFR testing of drives at  
6 Seagate?

7 A For Grenada drives?

8 Q Let's start with Grenada.

9 A Not to my knowledge. I don't believe  
10 we've ever had a Weibull beta or greater. We don't  
11 set it. It's calculated from the data.

12 Q Right.

13 A Right.

14 Q Has anyone ever suggested that -- that the  
15 data that Seagate's collected about its drives would  
16 support having a Weibull of 1 or greater than 1 for  
17 its reliability testing?

18 MS. MCLEAN: Objection. Vague, lacks  
19 foundation.

20 Q (By Mr. Goldich) Do you know?

21 A For Grenada?

22 Q For reliability testing generally.

23 A That we should set the beta to 1 or  
24 greater?

1 Q Yes.

2 MS. MCLEAN: Objection. Vague, lacks  
3 foundation, overbroad.

4 A No. We wouldn't -- we wouldn't  
5 specifically set the beta to anything. We would let  
6 the beta come out of the data.

7 Q (By Mr. Goldich) Do you use field data  
8 to -- to do reliability testing?

9 MS. MCLEAN: Objection. Vague, lacks  
10 foundation.

11 A Not to go to do reliability testing. Do  
12 we look at field data? Yes.

13 Q (By Mr. Goldich) When do you look at  
14 field data in connection with reliability in general?

15 MS. MCLEAN: Objection. Mischaracterizes  
16 testimony.

17 A We look at field data. One of the groups  
18 earlier in that that I mentioned, they look at field  
19 data. I'm not involved in that as much from a field  
20 standpoint, but Seagate does look at field data.

21 Q (By Mr. Goldich) That's because you're  
22 pre-release, right?

23 A Correct.

24 Q So there would be ongoing reliability

1 testing itself even before it comes to reliability  
2 testing.

3 Q Gotcha. "Fixed validation. Validation  
4 based MAT 1.2, 1.3 BTC failure rate the first 180  
5 hours versus MAT 2.0." Is this stating that this  
6 corrective action was -- was confirmed as a fix  
7 during these tests?

8 A Yes, more specifically in the MAT 2.0  
9 test.

10 Q And there were 23 of these head  
11 instability failures, right?

12 A Correct.

13 Q And it says here that the percent of  
14 failure is 1.243 percent, right?

15 A Correct.

16 Q What's the -- how -- what's the 1.243  
17 percent of? Is it of 1651 drives?

18 A It's 1.243 percent of the -- that's that  
19 relative component of the 7.006 percent in the top  
20 left.

21 Q Okay.

22 A So of that 7.006 percent raw number, that  
23 mode we're saying it is making up 1.24 of that.

24 Q Okay. Next to that, it says,

1 STATE OF COLORADO).

2 ss). REPORTER'S CERTIFICATE

3 COUNTY OF DENVER ).

4 I, Brittany D. Leis, do hereby certify that  
5 I am a Court Reporter and Notary Public within the  
6 State of Colorado; that previous to the commencement  
7 of the examination, the deponent was duly sworn to  
8 testify to the truth.

9 I further certify that this deposition was  
10 taken in shorthand by me at the time and place herein  
11 set forth, that it was thereafter reduced to  
12 typewritten form, and that the foregoing constitutes  
13 a true and correct transcript.

14 I further certify that I am not related to,  
15 employed by, nor of counsel for any of the parties or  
16 attorneys herein, nor otherwise interested in the  
17 result of the within action.

18 In witness whereof, I have affixed my  
19 signature this 4th day of August, 2017.

20 My commission expires December 13, 2017.

21  
22  
23 \_\_\_\_\_  
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